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A Case Study using the Biopsychosocial Vulnerability-Stress Model as a framework to understand the incarceration experience

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Abstract

In the United States, the Center for Disease Control estimates that about 80% of incarcerated inmates have a substance abuse problem. More than one fourth of inmates are in prisons because of drug related arrests. Additionally, many inmates have cooccurring mental illness disorders as well as health related issues. A multiple (four) case study design was used to explore the association between co-occurring diagnoses, antisocial traits and challenging behaviors within the incarcerated population. The analysis revealed that the four co-occurring diagnoses studied did contribute to poor health outcomes. Study findings suggest that there is a great need to create services within the Department of Correction to assist inmates with co-occurring mental illness and substance abuse for improved health outcomes.

Abstract

In the United States, the Center for Disease Control estimates that about 80% of incarcerated inmates have a substance abuse problem. More than one fourth of inmates are in prisons because of drug related arrests. Additionally, many inmates have co-occurring mental illness disorders as well as health related issues. A multiple (four) case study design was used to explore the association between co-occurring diagnoses, antisocial traits and challenging behaviors within the incarcerated population. The analysis revealed that the four co-occurring diagnoses studied did contribute to poor health outcomes. Study findings suggest that there is a great need to create services within the Department of Correction to assist inmates with co-occurring mental illness and substance abuse for improved health outcomes.

Introduction

Correctional facilities and corrections personnel throughout America are challenged with the management of the growing population of offenders with serious mental illness (Gelman, 2010; Steadman, Osher, Robbins, Case & Samuels, 2009). A recent survey by the Bureau of Justice Statistics (James and Glaze, 2006) found that more than half of all inmates ($n = 1,264,300$) inmates, not including individuals on probation or associated with community corrections, had some kind of mental health problem. The Bureau of Justice Statistics (BJS) further reported that 64% of local jail inmates, 56% of state prisoners, and 45% of federal prisoners had symptoms of serious mental illness (Fitzpatrick, 2006). However, the BJS survey only provided information about three main psychiatric diagnoses: (a) major depression, (b) psychotic disorders, and (c) bipolar disorder with mania. A substantial proportion of mentally ill incarcerated individuals in the prison system also have substance abuse or alcohol abuse problems (Young, 2003, p. 64). A systematic review by Prins (2014) summarized 28 studies published from January, 1989 to December, 2013 on the prevalence of mental illness in prisons in 16 states. This review noted that differences exist in the heterogeneity of samples, states, facilities, study designs, and diagnostic instruments used (p. 866). Nevertheless, Prins' review confirmed that the prevalence of mental illness is higher among incarcerated populations than the general public. In a similar review by Sarteschi (2013), also determined that half or more of all incarcerated

prisoners had mental health problems. There is compelling evidence that the prevalence of incarcerated persons with mental health and substance use problems is a significant health concern. Undoubtedly these statistics oblige the criminal justice systems and mental health systems to devote attention and resources to understanding and improving the health outcomes of this vulnerable population. This study seeks to describe the experiences of selected incarcerated persons to illuminate biological, psychological, and social factors contributing to health outcomes for persons with co-occurring illnesses.

Literature Review

The serious mentally ill (SMI) population represents almost 15% of the jail and prison population for males in the United States (Steadman, Osher, Robbins, Case & Samuels, 2009). Persons with an incarceration experience with SMI are also more likely to have comorbid substance use disorders (Dumais, Cote, Larue, Goulet, & Pelletier, 2014; Dumais, Cote, & Lesage, 2010). Along with mental health and substance abuse are other risk factors such as abuse histories, limited resources and unstable housing that plague persons with an incarceration experience (Kelly, Ramaswamy, Chen, & Denny, 2015). Sociodemographic and service utilization data from prison records showed that these same individuals acquired less schooling, attempted suicide more often, and had committed more violent and non-violent offences (Dumais et al., 2014).

Gender has been identified as a personal vulnerability. A qualitative study by Johnson et al. (2014) identified incarcerated women with co-occurring disorders as a vulnerable population. According to this study, providers reported that incarcerated women with mental illness and substance abuse histories were prone to sexually transmitted diseases and HIV infection, experienced more poverty, victimization, lack of education and job skills, and suffered from low self-esteem (Johnson et al., 2014; Bryne, 2005). Women face complex biopsychosocial challenges both in prison and upon reentry or transition to the community. Personality characteristics, combined with multiple vulnerabilities, influence how the person perceives the incarceration experience and may result in poor coping and a greater decline in self-care behaviors (Shelton, 2010). Clemmers (1940) socialization theory of 'prisonization' describes the way prisoners adapt to the general culture of prisons. Adaptations may take the form of mistrust and suspicion, forming relationships for safety reasons, social withdrawal and isolation (Goomany & Dickinson, 2015). These prisonization effects are known to jeopardize adaptive coping behaviors, particularly upon reentry to the community.

Theoretical Framework

The Biopsychosocial Vulnerability-Stress Model (VSM) provides a framework (Shelton, Barta, Wakai, Trestman, 2016; this issue) from which to understand and describe the interaction effects of personal and environmental factors among incarcerated persons and their ability to deal with the stressful event of incarceration.

This model proposes that both the vulnerability factors and stressor(s) need to be present for an adverse outcome (Ingram & Luxton, 2005) - of particular interest, health outcomes. According to Ingram & Luxton (2005), stressors are considered as life events, whether minor or major, that disrupt the individual's ability to maintain stability physically, emotionally, cognitively or socially; whereas vulnerabilities are the predispositional factors, or set of factors that set the stage for possible disordered state such as diabetes, HIV, past psychiatric history, personality disorders, vocational and interpersonal skills (p. 34). As separate concepts both stress and vulnerability provide useful information about individual characteristics and traits, however, together stress and vulnerability provides a more powerful description of psychopathology and health outcomes.

Purpose and Aim

The purpose of this descriptive case study is to understand and describe the personal vulnerabilities of persons with co-occurring mental health and substance abuse with the stress of an incarceration experience and the impact on health outcomes. It is proposed that the greater the personal vulnerabilities, the less environmental stress is necessary for poor health outcomes to result. The aim is to describe the similarities and differences within and between four cases presenting co-occurring mental health diagnoses and substance abuse in relation to an individual's personal vulnerabilities and the stress of incarceration and their health outcomes. An examination of the details

of these cases will inform future intervention research to improve health outcomes in this vulnerable population.

Methods

Yin's (2009) case study methodology provides the guiding framework for the descriptive and exploratory study design. Case studies, useful for providing rich descriptions of a phenomenon within its real life context are composed of five research components: 1) a study's questions; 2) the propositions, if any; 3) the unit(s) of analysis; 4) the logic linking the data to the propositions; and 5) the criteria for interpreting the findings (p.27). Yin concluded that operationally defining the unit of analysis assists with replication and efforts at case comparison. This study identifies personal and environmental factors of persons with an incarceration experience and examines how they affect health outcomes. A case study protocol was defined that outlines the procedures for conducting the research.

The research question for this study is: *"What are the similarities and differences of personal and environmental factors that contribute to psychological disorders and affect the health outcomes of correctional population?"* It is proposed that the greater the personal vulnerabilities, the less environmental stress is needed for poor health outcomes. Conversely, it is proposed that with less personal vulnerability, greater environmental stress is needed for poor health outcomes.

The identified “cases” are four co-occurring (mental illness and substance abuse) diagnoses as follows: Case 1: Anxiety and Substance Abuse, Case 2: Depression and Substance Abuse, Case 3: Antisocial and Substance Abuse, and Case 4: Bipolar and Substance Abuse. A protocol was developed that included the research question, the aim, the identified cases, and procedures for data extraction. The protocol is an important component of the overall progress and reliability of the case study keeping the researcher focused on the main tasks and goals of the study. The variables that guided data collection were derived from the VSM matrix (see Shelton, Barta & Anderson, 2016a, this issue). Each of these domains cross individual vulnerabilities and environmental stressors that ultimately affect health outcomes. The selected variables of interest to the cases were:

(1) *biological domain*: personal history of mental illness, age of onset of signs, symptoms and behaviors of mental illness, family history of mental illness, history of substance abuse and history of violence,

(2) *psychological domain*: history of aggression and impulsivity, DSM-IV axis I and axis II diagnoses, criminal behaviors, history of discipline, risk scores and treatment services utilized and,

(3) *social domain*: employment history, social support system and housing situation, number and length of incarcerations, religious affiliation, marital status and number of children, escape history, vocational needs and discharge plans.

Sample

This study retrospectively reviewed 36 closed, medical charts of persons with an incarceration experience who were at the end-of-sentence and who had co-occurring diagnoses of mental illness and substance abuse. The rationale for this sampling was to maximize what could be learned about this subset of incarcerated persons using the theoretical model. Inclusion criteria included: a) adult age; b) male or female; c) any race/ethnicity; d) end of sentence (case closed) greater than 2 years ago; and, e) meets the criteria for co-occurring mental illness and substance abuse disorder.

Data sources included an existing data set from a funded National Institute of Mental Health study (NIMH# #5R24-MH067030-05), merged with data extracted from a closed chart review to obtain selected variables identified in the VSM. An addendum to an existing Internal Review Board approval was obtained (UCHC IRB# 03-192).

Data from 36 closed inmate medical records created a sample distribution of 9 records across each of the four cases as follows:

Case	Sample size
Case 1 - anxiety and substance abuse	9
Case 2 - bipolar and substance abuse	9
Case 3 - depression and substance abuse	9
Case 4 - antisocial and substance abuse	9

The primary data gathering was accomplished using the data matrix (Shelton, Barta, & Anderson, 2016, this issue) and designed extraction worksheet that was based in theory and used to guide data collected (see Table 1). Use of a data extraction worksheet enables replication, thereby, improving reliability and construct validity (Yin, 2009). The researchers worked closely with medical records employees at the correctional facility archive for review and to secure a location for data collection. Data from the worksheet were then transposed from the worksheet to an excel format for each case. The excel format mirrored the data matrix extraction worksheet to maintain a record of evidence and to allow for single-case and cross-case analyses. An experienced researcher reviewed clinical data for inter-rater reliability. All data were stored in a locked file cabinet in the researcher's office that was also locked in in the University building for protection of inmate identity.

Table 1: Case Data Extraction Form

Study Number: _____

Date data extraction: _____

Diagnosis Subgroup: _____

Initials of extractor: _____

Demographic Information	Age	Gender	Education	Ethnicity	Marital Status	No Data
Family History	Mental Illness	Substance Abuse	Violent Behavior	Types of Abuse	Source of Abuse	
Personal History	Mental Illness	Substance Abuse	Violent Behavior	Types of Abuse	Source of Abuse	
Medical History	Clinic Visits	Medications	Treatment			
Aggressive/ Assaultive Behavior	Age at occurrence	Location of Behavior (while incarcerated, prior to incarceration)	Outcomes of Behavior (restraining order, charges pressed, incarceration)	Txt for Behavior	No Hx aggression or assault	
Number of Disciplinary tickets	Reason	Risk Scores				
Criminal Behavior	Offense	Severity of offense	Consequence	Escape Hx		
Employment History	Types of work	Length of employment	Disability benefits			
Incarceration History	Age at incarceration	Length of time		Recidivism		
Social Support	Number of visits	Significance of social support	Family	Religious affiliation		
Housing	Homeless	Type				
Discharge planning	Vocational needs	Treatment Follow up				

Data Analysis

Data analysis was planned as a two-step process: individual case analysis followed by a cross case analysis (Yin, 2009). Individual case analysis was used to identify personal vulnerabilities and environmental factors and the unique psychopathological and health outcome patterns within each single case. Data analysis began by systematically organizing data, narratives and words extracted from the record, matching variables selected from the matrix (Miles & Huberman, 1994). The

data was entered into the protocol's extraction worksheet once key variables were identified. The worksheets for each archival record provided a detailed framework for which to organize the data. Each record was reviewed with a deliberate and vigorous search for the presence of individual and environmental variables and related health outcomes. Records were read critically allowing for the potential of rival explanations to be considered.

A cross-case analysis was performed by aggregating the findings across the cases to illuminate the similarities and differences of personal and environmental factors that contribute to psychological disorders and affect the health outcomes of the total sample. An examination of key word searches and counts for themes emerged across the cases providing insightful interpretation of the narrative. Yin (2009) described pattern-matching as "one of the most desirable analytic technique which compares the empirically based pattern with a predicted one" (p. 138).

Results: Demographics

The demographics for all four cases are provided in Table 2. The sample (n= 36) found seventeen males (mean age of 30.2 years) and nineteen females (mean age of 34.5 years). The range in age at the time of the most recent incarceration for males (19 to 50 years old) was slightly younger than for females (20 to 53 years old). The educational level in all four cases ranged from eighth grade to two years of college. Ethnic groups represented in this sample are: 44% Caucasian (16 out of 36); 38% Black (14 out of 36);

11% Hispanic (4 out of 36); one individual of Hawaiian descent, and one multiracial (Puerto Rican, Italian and Irish) individual.

Table 2: Case Demographics

	Case 1: Anxiety & SA (n=9)	Case 2: Depression & SA (n=9)	Case 3: Antisocial & SA (n=9)	Case 4: Bipolar & SA (n=9)
Gender				
Female	5	5	5	4
Male	4	4	4	5
Mean age				
Female	36	36	29	33
Male	28	25	28	26
Ethnicity				
Black	5	2	3	4
Caucasian	1	2	4	5
Hispanic	3	4	1	
Asian				
Other		1	1	
Education				
8 th grade	2			
<12 th grade	3	3	4	2
High School	1	6	5	6
>1 yr college	3			1

Results: Within Case Analysis

Vulnerability stress factors are conceptualized as a set of predispositional factors that can lead to poor health outcomes in the event of a perceived and actual stressful encounter (incarceration). Each within case analysis follows and examines the presence

of biopsychosocial vulnerabilities with incarceration and the relationship to health outcomes.

Case 1: Anxiety and Substance Abuse

The main theme that emerged from analysis of the nine charts was the presence of unstable, chaotic and dysfunctional childhood related to family life (environmental stressors).

Biological domain

Overwhelming features of dysfunctional family history was the presence of physical, emotional or sexual abuse (7 out of 9) and history of neglect by parents (8 out of 9) during childhood developmental years. Reports of parents abusing alcohol and other substances such as crack cocaine dominated the records (8 of 9). The age of onset in early use of alcohol was 12-13 years, progressing to substances such as cocaine and heroin. Risk taking behaviors emerged in the form of driving fast and under the influence, engaging in sex to procure drugs, and stealing to buy drugs. Consequences of such risk taking behaviors were motor vehicle accidents, physical altercations during drug buys, prostitution to get money for drugs, and criminal behaviors. Individuals dropping out of school before finishing high school obstructed educational achievement. Only three out of 9 cases had one year of college while all the others had a high school degree or less.

Family history of mental illness, abuse and neglect added to dysfunctional and chaotic family life during childhood. Sexual abuse was not exclusive to the female gender. A young male who was sexually abused as a child by a neighborhood girl became involved with using marijuana daily by age 14 and demonstrated marked impulsivity with excessive emotionality and attention seeking behavior.

Utilization of health care services was sought for numerous somatic complaints such as back pain, leg aches, and headache or for emotional symptoms of anxiety while incarcerated. Detoxification from substances often was accomplished during incarceration.

Psychological domain

Strained and poor relationships with family members increased levels of anxiety and emotional impulsivity. There were often family patterns of substance dependence (8 out of 9) along with childhood abuse both influential in learned ways of coping with anxiety and stressors. Physical and sexual abuse often led to excessive use of substances and excessive emotionality and attention seeking behavior. For example, one chart noted that a female inmate responded to stressful situations by becoming self-abusive and by cutting herself. Personal unmet needs and the presence of intense anxiety were met through self-harm behaviors. The self-harm behavior resulted in numerous medical codes and the eventual design and implementation of a specific behavioral treatment plan to address the anxiety and emotional response. A quote in her chart poignantly

describes a personality feature consistent with antisocial traits: "I want what I want when I want it." Another example was a male who when sober described himself as depressed and anxious but when drinking becomes impulsive and aggressive resulting in threats of harm to others. This presentation carried over in the prison environment where he threatened harm if his he did not get his way and numerous transfers between prisons occurred during his many incarcerations.

Evidence of prisonization (environmental stress factor) was seen in several cases. One chart noted that a male inmate with poor coping skills was easily provoked when others crowded in his space and would threaten other inmates that often ended in physical altercations and disciplinary tickets. The determination by the DOC was made to give him a private cell that ultimately worked best for him and the other inmates. Another example is of an inmate who was diagnosed with post-traumatic stress disorder (PTSD) at the age of 15 ½ years old from abuse by a relative. During incarceration he was attacked twice and he also received 10 disciplinary tickets for offenses such as program violation, creating disturbances, and disobeying direct order. His trips to the clinic were for injuries and physical complaints. The cycle of abuse continued during incarceration.

Social domain

Most charts (7 out of 9) revealed that inmates had extensive history of unemployment or had a scattered employment history, thereby, requiring correctional

support for housing and income needs upon release. Poor coping, impulsivity and aggressive behaviors threatened social supports. Family support (Environmental Stress Factors) became particularly strained with repeated incarcerations and was considered a stressor for inmates as their end of sentence drew near. Inmates who were primary caregivers for children often lost contact with children as family members assumed the caregiver role and whose lives continued without the presence of the inmate. Although many inmates sought to rejoin the family upon release, strained relationships made this reunion tenuous.

Health Outcome

In eight out of nine charts reviewed, multiple individual vulnerability factors combined with multiple external vulnerability factors (ineffective coping skills, poor relationships, poor vocational skills and stressed family relationships) that resulted in poor health outcomes. Detoxification was a primary treatment intervention in prisons. Recidivism rates reflect the compounded effect of substance abuse, poor social skills, poor support systems, and lack of vocational skills despite discharge planning, referrals for rehabilitation services and medication management. Reflecting on the chart of a female who was raped and engaged in self-injurious behaviors both prior to and during incarceration, her anxiety disorder interfered with her physical health (poor eating, poor sleep, drug abuse) and she had more somatic complaints with each repeated incarceration. By her last incarceration at age 53 years old, her health had declined and

she had been diagnosed with cancer. Clearly her life was affected by her numerous individual vulnerabilities, environmental factors, and repeated incarcerations.

Inmates returning to the community were dependent upon families for their social, emotional, and financial needs despite having strained family relationships due to impulsive behaviors, and poor coping skills (returning to drugs to manage anxiety and sadness). When inmates could not get employed, had lack of housing, and poor adherence to treatment plans they returned to previous ways of coping and ultimately repeated arrests and incarcerations. These repeated incarcerations furthered diminished family support and interfered with the development of other social relationships.

Case 2: Depression and Substance Abuse

The presence of dysfunctional family dynamics (environmental stress factors), family history of mental illness and substance abuse was a major theme in this case; similar to Case 1. Another significant theme that emerged was the presence of history of violence or abuse (individual vulnerability factors).

Biological domain

Family history of mental illness and substance abuse and personal history of abuse and violence were clearly documented in five of the nine medical charts. Several charts (6 out of 9) documented that inmates witnessed physical violence against biological fathers, stepfathers, or a mother's multiple boyfriends. They themselves were also victims of abuse that often led inmates to early substance use (ages 12 and 13) and

aggressive and impulsive behaviors in school in response to this stressor. Many of these inmates (7 out of 9) also required mental health services in prison for depression, suicidal thoughts, and suicidal attempts. Clinic visits were for numerous somatic complaints for injuries sustained prior to incarceration (from physical and sexual abuse, physical altercations), symptoms of sexually transmitted diseases (STD's) diagnosed and treated during incarceration, and substance use related health problems (detoxification, cirrhosis, peripheral pain).

Psychological Domain

The predominant feature in this case was the presence of emotional dysregulation (5 out of 9). This reactivity to the stress of incarceration was evident in inmates requesting help from health care providers but then refusing to accept and adhere to the treatment plan. Still there were frequent clinic visits and mental health visits despite adherence issues. Psychological/emotional pain was also evident in the numerous somatic symptoms. For example, there was one chart that noted more than 70 clinic visits for depression and suicidal thought. Another chart documented numerous code whites (medical emergency) for one inmate who experienced "blackouts" when she was emotionally distraught. Others struggled with emotional dyscontrol that was displayed in their outbursts, threatening, and aggressive behaviors. Documentation in the charts revealed that impulsivity issues and violent behaviors resulted in disciplinary tickets with one chart documenting disciplinary tickets issued

for threatening, fighting, refusing to obey command, disruptive behavior, and flagrant disobedience. Some of these behaviors may be amplified as a response to environmental stress factors, such as manipulative behaviors as a means of coping and trying to gain a sense of personal control in a very controlled environment.

Social Domain

Poor social relationships, minimal support systems, and habitual substance abuse hindered sustained employment and adequate housing. Once released from prison, the majority of inmates (7 out of 9) did not stay engaged in treatment once they felt better then relapsed back into drug use which led for some to re-arrest. Living arrangements were dependent upon whether family members would allow the inmate to return home.

There were three charts that noted inmates had criminal charges in another state besides the one the study occurred in, making discharge planning, identifying social supports, and securing follow up treatment challenging.

Health Outcome

Lack of adherence to discharge and treatment plans often led to a return to drug use and re-incarceration. Each time the inmate was incarcerated employment was disrupted, along with housing, further straining family relationships. Inmates with

mental illness in particular struggle with adherence to treatment and discharge plans once released. Several charts noted (4 out of 9) that inmates would first agree to the employment, vocational, and treatment services offered and then decline these same services or did not continue with them after release. There were a few instances where moving out of state interrupted the treatment plan; but most were related to conflicted emotions, low self-esteem and poor self-efficacy. The usual treatment plan included treatment for substance abuse started while incarcerated followed by rehabilitation services after release.

Case 3: Antisocial and Substance Abuse

The two most prevalent patterns that emerged from these nine medical charts were: (1) the use of alcohol or substances starting at a young age (4 of 9 charts); and, (2) exaggerated emotional dysregulation and/or aggressive violent tendencies (6 of 9 charts).

Biological Domain

Family history of mental illness and substance abuse (3 of 9) was less prevalent in this case than in the previous two cases. Although physical and sexual abuse (3 out of 9) was not as predominant an issue as in the other cases, in one chart it did affect one female who was a victim of sexual abuse and who started drinking alcohol by seven years old. This led to a 32-year history of daily alcohol consumption and eventually abuse of street drugs. She suffered physical injuries from a motor vehicle accident from

drinking while driving, stab wounds sustained during drug buys, two accidental drug overdoses, multiple arrests for drug dealing, and estrangement from her husband all related to her substance abuse. The main reasons for clinic visits during incarceration for this case were for detoxification from alcohol/drugs and from injuries related to aggressive and violent behaviors. Clinic visits were high for this case (one chart noted 34 visits) with inmates seeking medical help for complaints such as back pain, headache, ear pain, abdominal pain, and migraines. Seeking medical help and then refusing treatment was a pattern noted in the majority of the charts (6 out of 9) that became worse with each subsequent incarceration.

Psychological Domain

Poor emotional control as evidenced by threatening, manipulating, arguing, and demanding behaviors was most notable in this case, which may be expected given the *Diagnostic Statistical Manual IV-TR* (DSM IV-TR), axis 2 diagnosis of antisocial personality disorder. Emotional responses depended upon the situation, however, if the inmate did not get what he/she wanted than they would become irrational, belligerent, and demanding. One incarcerated male threatened to harm to a 72-year-old inmate simply because of a perceived insult that was eventually rectified by changing cells. Despite these challenging behaviors, there were less disciplinary tickets issued to these inmates than might be expected. The range in the number of tickets was zero to two with only one chart noting 11 disciplinary tickets.

Social Domain

Unlike the other two cases, family members were perceived by inmates to be supportive and were often willing to have them return home if they had services in place. The most problematic for families were the high relapse potential and poor coping skills (threatening and argumentative behaviors) when a situational stressor occurred.

Health Outcome

Most inmates were receiving disability and had scattered employment history working "here and there." Three charts identified motor vehicle accidents related to intoxication resulting in physical disabilities and also led to arrests due to threatening police officers at time of arrest. One inmate had a long history of substance abuse and violence for which he received detoxification and anger management classes while incarcerated. Symptoms abated while in prison but resurfaced when in the community in the absence of a structured and controlled environment (prisonization effect). His violent behavior was the precipitant of three arrests. His angry, explosive behavior resulted in many consequences including poor health related to unmanaged diabetes. When he was angry he refused to have his blood sugar assessed and refused insulin coverage. Seeking and refusing treatment was a pattern of coping that became worse with each incarceration. His physical health declined where he ended up legally blind and in a wheel chair during his last incarceration.

Case 4: Bipolar and Substance Abuse

Parent-child conflict, oppositional behaviors, emotional dysregulation, and interpersonal relationship detachment were the major themes that came to light from this case.

Biological Domain

History of physical and sexual abuse was a prominent influence in early age substance abuse in six of the nine charts in this case. Females (3 of 4) were sexually abused by family members between the ages of five to 10 years old while males (3 of 5) experienced physical abuse by parents. As noted in Case 3, alcohol and drug abuse started at an early age, and in some cases progressed to intravenous heroin use. Over the years, inmates engaged in high-risk behaviors including prostitution, sharing needles for intravenous drug use, and committing criminal offenses. Clinic visits were for medication management for treating Bipolar Disorder symptoms and for impulsive, self-harm behaviors such as cutting wrist or throat when angry or upset to get the attention desired. Venereal disease from engaging in prostitution was often diagnosed in prison and treated at clinic visits in both males and females.

Psychological Domain

Extreme mood lability, emotional dysregulation, and overreaction to perceived stressors led to higher numbers of disciplinary tickets (7 out of 9) ranging from 11 to 32 tickets for disobeying a direct order, fighting, contraband, interfering with safe security,

and threatening. Emotions fluctuated from intense anger and threatening behaviors towards others to reporting feeling depressed and suicidal. Cognitive distortions such as perceived rejection by correctional officers or health care providers often resulted in emotional responses and explosive actions such as punching walls, threatening harm to self, and fighting. Behavior was often difficult to predict because of rapidly changing emotions and overreaction to perceived wrongs or changes in situations.

Social Domain

Relationships for this case were impaired and strained because of the neediness and emotional instability, returns to the street in prostitution, and drug involvement. Although family members expressed desire to be supportive the constant emotional turmoil is exhausting and frustrating so they withdraw support when the inmate returns to drugs, fighting, or criminal activity. Returning to previous living arrangements prior to incarceration were not always possible because of restraining orders due to fighting with a significant other or family member.

Health Outcome

Employment and housing were often unstable due to a lack of dependable social relationships, poor anger management, and abuse of drugs. There were multiple incarcerations related to assaults, possession of drugs and paraphernalia, selling drugs and prostitution. One inmate poignantly stated, "It is as if I grew up in the prison system."

Patterns of ineffective coping were seen in several charts. For example, one inmate tattooed “misfit” on his arm and would try to cut himself with pencils, staples or whatever might be available when he was upset, angry or agitated. The lack of a sense of responsibility and glorifying drug use interfered with obtaining employment and housing. All money earned went to buying drugs and the use of drugs meant absence from work. Additionally, relationships centered on drugs and promoted the same destructive behaviors and actions that led to incarceration.

Results: Cross Case Analysis

The research question for this study is: *“What are the similarities and differences of personal and environmental factors that contribute to psychological disorders and affect the health outcomes of correctional population?”* Yin’s (2009) recommends a cross-case thematic analysis from which conclusions may be drawn about patterns between cases and to describe potential relationships between individual vulnerability and environmental stress factors on health outcomes. Thematic analysis revealed the following themes consistent across all four cases: (a) unstable, chaotic family life; (b) repeated incarcerations; and (c) ineffective coping skills (see Table 3).

Table 3: Cross-Case Thematic Analysis

- I. Unstable, Chaotic Family Life
 - a) Lack of support and/or neglect
 - b) History of mental illness and/or substance abuse
 - c) Physical, emotional and/or sexual abuse
- II. Repeated Incarcerations
 - a) Involvement in substance abuse
 - b) Non-adherence to treatment and medications
 - c) Declining physical health
- III. Ineffective Coping
 - a) Substance abuse impacts unemployment
 - b) Repeated incarcerations strain social relations and living arrangements
 - c) Lack of follow up with recommended treatment

I. Unstable, Chaotic Family Life

Unstable, chaotic family life was a similar theme across the four cases which presented as a disrupted family life, a family history of either substance abuse/alcohol abuse or mental illness or both. History of physical, emotional or/and sexual abuse by a parent, sibling, significant other, or stranger was a major in creating a sense of stress, instability, and insecurity that increased anxiety within the individual inmate often at a young age. In most cases, parents were perceived as either neglectful or harsh that often triggered emotional dysregulation and early onset of abusing alcohol and substances. Insecure living arrangements and frequent moving from home to home with the

involvement of Department of Children and Family (DCF) due to neglect or abuse or living in foster homes disrupted the sense of stability for most inmates at a young age.

Aggressive and violent interactions between parents were witnessed by inmates who turned to substance abuse or became aggressive in their adult years in response to stressors.

One inmate witnessed physical abuse from his biological father, step-father and mother's boyfriends against his mother. He started abusing alcohol by 13 years old and dropped out of high school in 10th grade due to his impulsive and aggressive behaviors (Case 2). In some families, parental conflicts meant abandonment where one parent, typically the father, left home and at times inmates were sent to live with another family member or readjust to step-parents or boyfriends/girlfriends.

Family history of mental illness or substance abuse was experienced as losses if the parent was hospitalized for treatment and in some situations suicide from depression or drug overdose. Substances and alcohol interfered with parental relationships seen in divorces, separations and domestic violence and in parent-child relationships seen by absence of one parent from the home, abandonment or abuse. Employment history was sporadic because "I can't work and do drugs" (Case 4).

There were occasional exceptions or differences in each of the four cases. For example, in Case 2, three charts had intact and supportive families with no history of mental illness, violence or abuse. One notable exception was a female inmate whose

perception of herself as a “drug abuser” in the family unit was evident in her comment, “I am hard pressed to try to explain why my life has been so chaotic. I don't know why I mess up.” She reported poor self-image and that self -stigma prevented her from being able to avail herself to the help from her family. This only increased her social withdrawal and sense of isolation. There were two occasions of family interventions (Case 3 and 4) when family members hoped to interrupt the pattern of substance abuse by reporting the family member to police authority.

II. Repeated Incarcerations

Criminal activity, across all cases, was linked to substance abuse and resistant behaviors. Possession of narcotics, motor vehicle accidents related to intoxication, selling and buying drugs led to re-arrest. Poor adherence to psychiatric medications, poor follow up on treatment for mental health and substance abuse increased chances of relapse and returning to substances to alleviate symptoms was also present across all cases. One inmate politely refused assistance with vocational needs and follow up psychiatric treatment stating, “I can find my own resources. I have places to go. I can manage my symptoms” (Case 2). Recidivism rates reflect these compounded effects of substance abuse, poor social and vocational skills, and treatment medication non-adherence.

When inmates did not adhere to treatment planning such as managing diabetes by allowing the correctional nurse to take their blood sugar and then to take the appropriate dosage of insulin there were physical complications. There were charts that note inmates health declined from refusing to submit to the request to have a finger stick for blood glucose ultimately refusing insulin and then not adhering to prescribed diet. While many reasons underlie this resistance, this behavior did reflect poor health outcomes. In a similar fashion, there were many incidences of refusal to consistently take prescribed psychiatric medications leading to a worsening of depressive symptoms and suicidal thoughts and attempts.

In contrast, in three of the four cases (Cases 2, 3 and 4), recidivism improved when an inmate adhered to prescribed medications and treatment planning once released to a community program that offered a structured and controlled environment such as the Jail Diversion program, or a substance abuse program. When persons with an incarceration experience had external support either from family members, the DOC, or health care providers they fared better and prevented relapse in some situations.

III. Ineffectual Coping

Family disorganization, lack of positive social supports, and stressful interpersonal relationship were prevalent issues across the cases. Distress tolerance and poor coping skills often triggered increased substance abuse during situational crises such as possible eviction from home, loss of custody of a child, and rejection from

family or significant other or as a means of numbing emotional pain. Abusing alcohol and substances as a means of coping and avoiding emotional pain was seen across the cases (55% in Case 1, 66% in Case 2, 55% in Case 3, and 44% in Case 44%). By teenage years, most inmates sought alcohol and drugs daily basis that eventually progressed to abusing substances such as cocaine, heroin, benzodiazepines and hallucinogens.

Impulsive behaviors, fluctuating emotions, and attention seeking actions, consistent across the four cases, were magnified during an incarceration event as inmates depended on DOC for meeting their needs. Other environmental stressors, obtaining or maintaining employment, and securing housing, in combination with impaired coping skills and insufficient supports, was enough to trigger relapse once inmates were discharged from prison. Repeated stays in and out of prison strains relations with family had consequences when inmates fell back into past conduct. One chart noted how this stigmatizing behavior diminishes self-esteem in self proclaimed statement such as "I'm going to hell....I feel unloved" (Case 2).

What we see across these cases are life style changes as criminal activity increases due to a multitude of circumstances and factors. Employment shifted from jobs such as construction worker, auto body repair, and cashier to stripper, drug dealer, and prostitute. Vocational and educational needs were critical for end of sentence discharge planning as inmates returned to previous pattern of coping when outside the structure and support of DOC.

Persons with an incarceration experience who showed resilience (personality trait), or the ability to resist the effect of incarceration experience (fewer disciplinary tickets), had fewer (one or two) rearrests and did rely on their support systems, engaged in treatment, and participated in community programs. These charts noted the ability to demonstrate learning social skills and adaptive coping responses. Having resilient traits showed that one needs a greater amount of stress before symptoms emerged.

Health Outcomes

The within case and cross-case analyses support the hypothesis that the greater the personal vulnerabilities, the less environmental stress is necessary for poor health outcomes.

Poor health outcomes. Substance abuse and mental illness (individual vulnerabilities) affected the physical psychological, and social health outcomes of this vulnerable population. Substance abuse negatively impacted inmate physical health with neuropathy, blindness, loss of memory and impaired ambulation resulting in the need for disability, liver disease, HIV, and problems with seeking employment. Significant memory deficits were related to excessive alcohol abuse contributing to unemployment, risky behaviors and repeated incarcerations.

Substance abuse also led to criminal activity related to possession of narcotics, motor vehicle accidents related to intoxication, selling and buying drugs and

subsequent arrest or re-arrest. With each arrest and sentencing, persons with an incarceration experience became less agreeable and less motivated for therapy, stopped medications, and detached from pro-social activities such as work. Repeated incarcerations or prolonged lengths of sentences did affect already strained family supports and impact living arrangements across all four cases. In some situations child-parent contact were prohibited or children were removed from the care of the inmate

Positive health outcomes. In all four cases positive health outcomes were related to the supportive function of being in a structured, controlled environment in the community, leading to a reduced risk of repeated relapse. At the time of release and return to the community, programs such as Jail Diversion and community programs provided the necessary structure to promote health and reintegration. In combination with supportive families, absence of abuse or mental illness, and early interventions during incarceration seemed to be related to healthier outcomes. Those with support from family had briefer lengths of stay and fewer numbers of incarcerations. In Case 4 alone there were three charts with healthier outcomes. One family engaged in a “family intervention” for their 24-year-old daughter involved in IV heroin. Her incarceration was brief, she was connected with a community program supported by parents and boyfriend, and there was no evidence of relapse at the time of the chart review. Charts of inmates who were adherent with treatment for depression while incarcerated and had prior history of employment demonstrated more positive outcomes. Despite re-

arrest, each prison stay was shorter and there were indications that these individuals had a willingness to adhere to discharge plans.

Limitations

A limitation of the case study design is the potential for investigator bias. To this end, the authors attempted to analyze data from different perspectives in relation to the propositional statements. Charts were read with a critical eye for data that both supported and refuted the research inquiry. From a research perspective, the archival data can be subject to their own biases or shortcomings. For instance, charts may be subject to the health care providers bias and some lacked completeness of information. Other limitations are the small sample size, data collection from one source lacking triangulation, and archival records that were missing information that can produce systematic bias.

Discussion

The results of this case study provides information on the research question: *“What are the similarities and differences of personal and environmental factors that contribute to psychological disorders and affect the health outcomes of correctional population?”* The themes identified during data analyses showed that across the cases there is a connection between personal vulnerabilities and environmental factors and health outcomes. The greater the vulnerability factors such as history of alcohol and/or

substance abuse, family history of mental illness, history of abuse, and incarceration did negatively affect health outcomes resulting in poorer health.

Identified barriers to positive health outcomes included impaired family functioning, ineffective coping skills, lack of family and social support, mental illness, and substance abuse which affected social relations, ability to maintain a job, housing and declining physical health. Extensive abuse of alcohol led to characteristic health problems such as elevated liver enzymes, memory deficits, appetite and sleeping disturbances. Detoxification and close observation became a primary intervention in the correctional setting with some inmates experiencing severe withdrawals. Resistance to treatment and poor adherence seriously contributed to poor health outcomes. As in the case of a diabetic, although having predisposed genetic factors for diabetes, this inmate suffered diabetic crisis from refusal to adhere to treatment and by his last incarceration was wheel chair bound suffering from severe neuropathy. Other examples include HIV testing among intravenous drug users and sexually transmitted diseases from unprotected sexual relationships.

Factors contributing to positive health outcomes included strong family and social support, steady or consistent employment, motivation and commitment to involvement in rehabilitation, having a place to live, and clinical interventions to reduce repeated incarcerations. Treatment interventions that addresses co-occurring disorders,

vocational needs, and cooperative relationships between DOC and community agencies are important to reduce incarcerations and improve health outcomes.

Conclusions

This study sought to explore the utility of the VSM framework (Shelton, et al 2016; this issue) from which to understand and describe the interaction effects of personal and environmental factors among incarcerated persons and their ability to deal with the stressful event of incarceration. Recommendations for future intervention research that will improve health outcomes in this vulnerable population are based on a number of conclusions that emerged. A relationship between an individual's vulnerabilities, life stressors and health outcomes was demonstrated in this study and can be a starting point for further theory development. In case study methodology, generalizations are analytical versus statistical and can generalize to theory rather than a population (Dubois & Gibbert, 2009). We found the application of the Biopsychosocial Vulnerability-Stress Model to persons in prison and post-incarceration beneficial as both a research and a clinical assessment tool. As such, it can assist to provide a common language for clinical researchers collaborating with correctional clinicians to identify those inmates most vulnerable to stressors; and, to identify tailored strategies that will help to mitigate poor health outcomes.

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